

(19) 日本国特許庁 (J P)

## (12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平8-302080

(43) 公開日 平成8年(1996)11月19日

(51) Int. Cl. <sup>6</sup>	識別記号	序内整理番号	F I	技術表示箇所
C 0 8 L 23/02	L C D		C 0 8 L 23/02	L C D
C 0 8 J 5/00	C E S		C 0 8 J 5/00	C E S
C 0 8 K 5/00	K E G		C 0 8 K 5/00	K E G
C 0 8 L 23/04			C 0 8 L 23/04	

審査請求 未請求 請求項の数 7 O L (全 5 頁)

(21) 出願番号	特願平7-106226	(71) 出願人	000010065 フクビ化学工業株式会社 福井県福井市三十八社町33字66番地
(22) 出願日	平成7年(1995)4月28日	(72) 発明者	秋田 清 福井県福井市三十八社町33字66番地 フク ビ化学工業株式会社内
		(74) 代理人	弁理士 鈴木 郁男

(54) 【発明の名称】 持続性を有するオレフィン系防虫樹脂組成物およびその成形体

## (57) 【要約】

【目的】 害虫に対する防虫作用の持続性を制御することができ、長期間にわたって防虫作用の持続性を有し、しかも耐候性に優れた防虫樹脂組成物およびその成形体を提供する。

【構成】 (A) 相対的に低移行性のオレフィン系重合体100重量部と、(B) 相対的に高移行性のエチレン系重合体10乃至400重量部とを組み合わせ、この組み合わせに(C) ビスロイド系防虫剤0.3乃至15重量部を含有させる。

## 【特許請求の範囲】

【請求項1】 (A) 相対的に低移行性のオレフィン系重合体100重量部、(B) 相対的に高移行性のエチレン系重合体10乃至400重量部、及び(C) ビスロイド系防虫剤0.3乃至15重量部を含有することを特徴とする防虫作用の持続性を有する防虫樹脂組成物。

【請求項2】 相対的に低移行性のオレフィン系重合体(A) が高密度ポリエチレン、中密度ポリエチレンまたはポリプロピレン系重合体である請求項1記載の防虫樹脂組成物。

【請求項3】 ポリプロピレン系重合体、ホモポリマー、ランダム・コモノマー及びブロック・コモノマーから成る群より選択されたポリプロピレン系重合体である請求項2記載の防虫樹脂組成物。

【請求項4】 相対的に高移行性のエチレン系重合体が低密度ポリエチレン、直鎖状低密度ポリエチレンまたはエチレン系共重合体である請求項1乃至3の何れかに記載の防虫樹脂組成物。

【請求項5】 相対的に低移行性のオレフィン系重合体(A) が高密度ポリエチレンであり且つ相対的に高移行性のエチレン系重合体(B) が低密度ポリエチレンである請求項1記載の防虫樹脂組成物。

【請求項6】 相対的に低移行性のオレフィン系重合体(A) が結晶性ポリプロピレン系重合体であり且つ相対的に高移行性のエチレン系重合体(B) が低密度ポリエチレンである請求項1記載の防虫樹脂組成物。

【請求項7】 請求項1乃至5の何れかに記載の組成物から成ることを特徴とする防虫作用の持続性を制御することができる防虫樹脂成形体。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、持続性を有するオレフィン系防虫樹脂組成物およびその成形体に関するもので、より詳細には、厨房器の箱や流し台、電子機器のハウジング素材、自動販売機、床材、壁材、天井材等へのゴキブリ、アリ、ムカデ、ユスリカ、シロアリ等の進入を阻止したり、衣類の収納ケース、タンス等へのイガ、カツオブシムシの進入を阻止するための、ビスロイド系を主成分とした持続性を有するオレフィン系防虫樹脂組成物およびその成形体に関する。

## 【0002】

【従来の技術及びその問題点】 現在、住宅様式の変化により、カビの発生が促進され、害虫の発生が増大している。これらの被害の対策には、従来、殺虫剤を用いたエアゾール、燻蒸剤、毒餌や捕獲器などの利用が一般に行われているが、効果の持続性が長くて1年程度と不十分である。

【0003】 防虫性の持続性をもたせるための処理方法として、防虫剤をマイクロカプセル化させて持続性の向上を図ったり、ポリエチレンやポリプロピレンに防虫剤

を含有させる方法がとられているが、衛生害虫、飛来害虫、不快害虫、衣類害虫等で持続性により効果が発現する場合は、効果が不十分であったり、効果の持続性が短いという欠点を有しており、さらにコスト高につくことも問題であった。

【0004】 また、有機リン系殺虫剤は安全性に問題点があり、シロアリに対しても問題視されている。

## 【0005】

【発明の課題】 そこで、従来の技術が有している効果の不十分性や持続性の短い欠点を解決するべく検討した結果、複数種のオレフィン系重合体を組み合わせてビスロイド系防虫剤を配合すると、害虫に対する防虫作用の持続性を制御することができ、しかも長期間にわたって防虫作用の持続性が得られることを見いだした。

【0006】 即ち、本発明の目的は、害虫に対する防虫作用の持続性を制御することができ、長期間にわたって防虫作用の持続性を有し、しかも耐候性に優れた防虫樹脂組成物およびその成形体を提供するにある。

## 【0007】

【問題を解決するための手段】 本発明によれば、(A) 相対的に低移行性のオレフィン系重合体100重量部、(B) 相対的に高移行性のエチレン系重合体10乃至400重量部、及び(C) ビスロイド系防虫剤0.3乃至15重量部を含有することを特徴とする防虫作用の持続性を有する防虫樹脂組成物並びにこの樹脂組成物から成る成形体が提供される。

## 【0008】

【作用】 本発明では、(A) 相対的に低移行性のオレフィン系重合体100重量部と、(B) 相対的に高移行性のエチレン系重合体10乃至400重量部とを組み合わせ、この組み合わせに(C) ビスロイド系防虫剤0.3乃至15重量部を含有させたことが特徴である。

【0009】 上記オレフィン系重合体の組み合わせを用いることにより、オレフィン系重合体の単独を使用する場合に比べて、害虫に対する防虫作用の持続性を制御することができ、長期間にわたって防虫作用を持続させることができ、しかも耐候性を顕著に向上させることができる。

【0010】 後述する表1を参照されたい。オレフィン系重合体単独にビスロイド系防虫剤を配合した場合、防虫作用の著しく劣るものもあり、また比較的短時間の使用では十分な防虫作用(高いノックダウン率)を示すものもあるが、この後者のものでは耐候試験(60℃×6カ月の促進試験)後には防虫作用は著しく低下する。

【0011】 これに対して、(A) 相対的に低移行性のオレフィン系重合体と、(B) 相対的に高移行性のエチレン系重合体との組み合わせを使用し、この組み合わせにビスロイド系防虫剤を配合した組成物では、比較的短時間の使用では勿論十分な防虫作用を示すと共に、耐候試験後にも初期とほぼ同じ防虫作用を示すのであ

3

て、この組成物は、防虫作用の持続性は勿論のこと、耐候性にも顕著に優れていることが明らかである。

【0012】一般に、樹脂成形体中に配合した防虫剤により防虫作用が発現されるのは、移行 (migration) 、即ち可塑化プラスチックに配合された配合剤が、配合物内で高濃度の側から低濃度の方 (表面) へ移動する現象によるものである。この移行現象の生成する程度はプラスチックと配合剤との相溶性等の性質にも関連している。

【0013】相対的に低移行性のオレフィン系重合体にピレスロイド系防虫剤を配合した場合、防虫剤の移行が防虫作用を示すというには極めて少なく、一方相対的に高移行性のエチレン系重合体にピレスロイド系防虫剤を配合した場合、防虫作用の初期には優れた防虫作用を示すが、防虫剤の移行があまり早すぎるため、防虫作用の持続性に欠けるのに対して、本発明において、これらの両樹脂の組み合わせにピレスロイド系防虫剤を配合すると、上記何れの場合から予測されるよりも、耐候試験後の防虫作用が飛躍的に向上するのであって、これは両樹脂の分散構造がピレスロイド系防虫剤の移行を最適な範囲に制御し、優れた防虫作用とその持続性とを付与しているものと思われる。

【0014】本発明において、(A) 相対的に低移行性のオレフィン系重合体と、(B) 相対的に高移行性のエチレン系重合体とを、上記量比で用いることも重要であり、(B) 相対的に高移行性のエチレン系重合体の含有量が上記範囲よりも少ないと、防虫作用のレベルそのものが低くなり、一方上記範囲よりも多いと、防虫作用に持続性や耐候性が低下する傾向がある。

【0015】本発明において、防虫剤としてピレスロイド系防虫剤を使用するのは、このものが人畜に対する安全性と防虫作用との組み合わせに優れていることとオレフィン系重合体に対する混練性と、適度な移行性を有することによるものであるが、上記量比で配合する場合に、優れた防虫作用と持続性とが得られる。即ち、上記範囲より少ないと防虫作用やその持続性が本発明に比してかなり低下する傾向があり、一方上記範囲よりも多いと樹脂組成物の物性が低下したり、効果上も格別の利点がなく、経済的に不利である。

【0016】

【発明の好適態様】本発明において、相対的に低移行性のオレフィン系重合体 (A) としては、高密度ポリエチレン (HDPE)、中密度ポリエチレン (MDPE) またはポリプロピレン系重合体が好適に使用され、ここで、ポリプロピレン系重合体としては、ホモポリマー、ランダム・コモポリマー及びブロック・コモポリマー等の結晶性ポリプロピレン系重合体を使用される。

【0017】一方、相対的に高移行性のエチレン系重合体としては、低密度ポリエチレン (LDPE)、直鎖状低密度ポリエチレン (LLDPE) またはエチレン系

4

重合体が好適に使用され、ここで、エチレン系系重合体としては、エチレン-酢酸ビニル共重合体、エチレン-アクリル酸共重合体、アイオノマー (イオン架橋エチレン共重合体)、エチレン-プロピレン共重合体、エチレン-ブテン共重合体等が使用される。

【0018】適度の相溶性を有し所謂海-島或いは層状分布等の分散構造を取る樹脂の組み合わせが好ましく、例えば、相対的に低移行性のオレフィン系重合体 (A) が高密度ポリエチレンであり且つ相対的に高移行性のエチレン系重合体 (B) が低密度ポリエチレンである組み合わせが好ましいものである。

(A) が結晶性ポリプロピレン系重合体であり且つ相対的に高移行性のエチレン系重合体 (B) が低密度ポリエチレンである組み合わせが好ましいものである。

【0019】ピレスロイド系防虫剤 (C) としては、テラトリン、ピレトリン、アレシリン、プラレトリン、フラメトリン、レスメトリン、ピスメトリン、フェノトリン、ペルメトリン、ピフェントリン、シフェノトリン、シフルトリン、デルタメトリン、トラロメトリン、エンベントリン、フタルスリン、フェンバレート、サイパーメトリン、サイフェノスリン、エトフェンブロックス、フルフェンブロックス、フルプロキセフェン及びシラフルオフェンから成る群より選択された少なくとも1種のピレスロイド系化合物が単独或いは2種以上の組み合わせで使用される。

【0020】(A) 相対的に低移行性のオレフィン系重合体100重量部に対して、(B) 相対的に高移行性のエチレン系重合体を、10乃至400重量部、特に30乃至300重量部の量で用いるのがよく、(B) 相対的に高移行性のエチレン系重合体の配合重量部を変更することにより、防虫作用の持続性を制御することができる。即ち、(B) 成分の配合量を多くする (少なくする) ことにより、ピレスロイド系防虫剤の単位時間当たりの移行量を多くする (少なくする) ことができる。

【0021】(C) ピレスロイド系防虫剤の量は、(A) の100重量部に対して0.3乃至15重量部、特に0.5乃至8重量部配合するのがよい。

【0022】ピレスロイド系防虫剤の配合の仕方には、樹脂の混練時にピレスロイド系防虫剤が存在する限り、特に制限はなく、例えば (A) 及び (B) の両方の樹脂に同時に配合しても、或いは一方の樹脂に予め配合してもよい。勿論、ピレスロイド系防虫剤を高濃度で配合したマスターバッチを予め調製し、このマスターバッチを未配合の樹脂と配合混練するようにすることもできる。

【0023】本発明の樹脂組成物には、必要に応じて他の添加物、例えば、無機フィラー類、中和剤、酸防止剤、紫外線吸収剤、帯電防止剤、結晶核剤、顔料、分散剤、過酸化物等を添加することができる。

【0024】また、本発明の樹脂組成物は、押出成形、インプレッション成形、射出成形、ブロー成形、プレス成

形等の成形が可能であり、厨房器の箱、流し台、電子機器のハウジング素材、床材、壁材、天井材、衣類の収納ケース、タンス等或いはその構成部品乃至部材として有用である。

【0025】以下実施例により本発明を具体的に説明するが、本発明はこれら実施例に限定されるものではない。

#### 【0026】実施例1

高密度ポリエチレン30重量部（ハイゼックス 3300F 三井石油化学製）と低密度ポリエチレン70重量部（ミラソン 12 三井石油化学製）とにビスロイド系防虫剤（エトフェンブロックス 三井東圧化学製）1重量部を含む組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0027】実施例2

高密度ポリエチレン50重量部（ハイゼックス 3300F 三井石油化学製）と低密度ポリエチレン50重量部（ミラソン 12 三井石油化学製）とにビスロイド系防虫剤（エトフェンブロックス 三井東圧化学製）1重量部を含む組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0028】実施例3

高密度ポリエチレン70重量部（ハイゼックス 3300F 三井石油化学製）と低密度ポリエチレン30重量部（ミラソン 12 三井石油化学製）とにビスロイド系防虫剤（エトフェンブロックス 三井東圧化学製）1重量部を含む組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0029】実施例4

高密度ポリエチレン50重量部（ハイゼックス 5000S 三井石油化学製）と低密度ポリエチレン50重量部（ミラソン 50 三井石油化学製）とにビスロイド系防虫剤（アレスリン 住友化学製）1重量部を含む組成物を厚み1.0mmのシートに押出成形した。

#### 【0030】実施例5

結晶性のポリプロピレン50重量部（ハイボール F301 三井石油化学製）と低密度ポリエチレン50重量部（ミラソン 50 三井石油化学製）とにビスロイド系防虫剤（アレスリン 住友化学製）1重量部を含む組成物を厚み1.0mmのシートに押出成形した。

#### 【0031】比較例1

結晶性のポリプロピレン100重量部（ハイボール F301 三井石油化学製）とビスロイド系防虫剤（エトフェンブロックス 三井東圧化学製）1重量部を含む

組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0032】比較例2

低密度ポリエチレン100重量部（ミラソン 50 三井石油化学製）とビスロイド系防虫剤（エトフェンブロックス 三井東圧化学製）1重量部を含む組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0033】比較例3

低密度ポリエチレン100重量部（ミラソン 50 三井石油化学製）とビスロイド系防虫剤（アレスリン 住友化学製）1重量部を含む組成物を厚み1.0mmのシートに押出成形した。

#### 【0034】比較例4

高密度ポリエチレン50重量部（ハイゼックス 3300F 三井石油化学製）と低密度ポリエチレン50重量部（ミラソン 12 三井石油化学製）を含む組成物を厚み0.13mmのフィルムをインフレーション成形した。

#### 【0035】※ ゴキブリに対する効力性

実施例1～5および比較例1～4で得られたシートおよびフィルムについて防虫効果の評価を行った。その方法は、上記シートおよびフィルムに、チャパネゴキブリ雌雄各5頭を直径9cmビーカー内に入れ、直接接触させた時のノックダウン率の経時変化を調べた。試験は、製造直後と60℃下で6ヶ月間の耐熱処理した試験体について行った。その結果を表1に示す。

#### 【0036】

#### ノックダウン頭数

$$\text{ノックダウン率 (\%)} = \frac{\text{全ゴキブリ頭数}}{\text{ノックダウン頭数}} \times 100$$

【0037】比較例の結果より、結晶性のポリプロピレンは、初期効果が低く、耐熱処理後においても余り効果は変わらず実用的な効果を有していないことが知れる。さらに、低密度ポリエチレンの場合は、初期効果は高いが持続性が短いことが知れる。一方、実施例においては、初期効果が高く耐熱処理後においても実用的な効果を有しており、持続性が高いことが判明した。さらに、オレフィン系重合体の比率を変えることにより、用途に応じて持続性を制御できることがわかった。

#### 【0038】

#### 【表1】

試験体	耐候処理	ノックダウン率 (%)							
		2	5	12	24	48	72	96	(hr)
実施例	1	無	20	30	40	60	70	90	100 ←
		60℃×6ヶ月	10	30	30	50	70	70	90
	2	無	20	40	40	60	80	80	100 ←
		60℃×6ヶ月	20	40	40	60	70	80	70
	3	無	10	30	30	40	60	70	90
		60℃×6ヶ月	0	10	30	30	60	80	90
	4	無	0	10	20	40	40	60	80
		60℃×6ヶ月	0	0	20	30	30	50	60
	5	無	0	10	30	30	40	40	60
		60℃×6ヶ月	0	0	20	20	40	20	50
比較例	1	無	0	0	10	10	10	20	20
		60℃×6ヶ月	0	0	10	20	30	30	40
	2	無	20	30	50	70	80	100	←
		60℃×6ヶ月	0	0	0	10	10	30	30
	3	無	10	20	40	60	80	80	80
		60℃×6ヶ月	0	0	0	10	10	10	20
	4	無	0	0	0	0	0	0	10
		60℃×6ヶ月	0	0	0	0	0	0	0

## 【0039】

【発明の効果】本発明によれば、(A) 相対的に低移行性のオレフィン系重合体100重量部と、(B) 相対的に高移行性のエチレン系重合体10乃至400重量部とを組み合わせ、この組み合わせに(C) ビスロイド系

防虫剤0.3乃至15重量部を含有させたことにより、オレフィン系重合体の単独を使用する場合に比して、害虫に対する防虫作用の持続性を制御することができ、長期間にわたって防虫作用を持続させることができ、しかも耐候性を顕著に向上させることができる。

**Disclaimer:**

This English translation is produced by machine translation and may contain errors. The JPO, the INPIT, and those who drafted this document in the original language are not responsible for the result of the translation.

**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 23:52:33 JST 05/28/2008

Dictionary: Last updated 04/11/2008 / Priority: 1. Chemistry / 2. Medical/Pharmaceutical sciences / 3. Natural sciences

---

**FULL CONTENTS**

---

**[Claim(s)]**

[Claim 1] (A) The insect proof resin composition which has the durability of the insect control operation relatively characterized by containing the ethylene system polymer 10 or 400 weight parts and (C) pyrethroid system insecticide 0.3, or 15 weight parts of high translatability on the olefin system polymer 100 weight part of low translatability, and (B) relative target.

[Claim 2] The insect proof resin composition according to claim 1 whose olefin system polymer (A) of low translatability is high density polyethylene, medium density polyethylene, or a polypropylene system polymer relatively.

[Claim 3] The insect proof resin composition according to claim 2 which is the polypropylene system polymer chosen from the group to which a polypropylene system polymer changes from a homopolymer, random Como Pori Maher, and Brock Como Pori Maher.

[Claim 4] An insect proof resin composition given in any of the Claims 1-3 whose ethylene system polymer of high translatability is low density polyethylene, normal chain-like low density polyethylene, or an ethylene system copolymer relatively they are.

[Claim 5] The insect proof resin composition according to claim 1 whose ethylene system polymer (B) of high translatability the olefin system polymer (A) of low translatability is high density polyethylene relatively, and is low density polyethylene relatively.

[Claim 6] The insect proof resin composition according to claim 1 whose ethylene system polymer (B) of high translatability the olefin system polymer (A) of low translatability is a crystalline polypropylene system polymer relatively, and is low density polyethylene relatively.

[Claim 7] The insect control resin Plastic solid which can control the durability of the insect control operation characterized by consisting of a constituent given in any of Claims 1-5 they are.

---

**[Detailed Description of the Invention]**

[0001]

[Industrial Application] In this invention, it is related with the olefin system insect proof resin composition which has durability, and its Plastic solid. In detail Therefore, the box and dresser with sink of a cookroom machine, the housing material of an electric device,

The cockroach to an automatic vending machine, a flooring material, a wall material, ceiling material, etc., Ali, the centipede, a chironomid, It is related with the olefin system insect proof resin composition which has the durability which used the pyrethroid system for preventing penetration of a termite etc. or preventing penetration of the clothes moth to the storage case of clothing, a wardrobe, etc., and a carpet beetle as the principal component, and its Plastic solid.

[0002]

[Description of the Prior Art] The development of mold is promoted by change of a housing style and the development of a vermin is increasing now. Although use of the aerosol, the fumigant and poison bait which used the insecticide, a capture machine, etc. is generally conventionally carried out to the measure against such damage, the durability of an effect is long and as inadequate as about one year.

[0003] Although microencapsulation of the insecticide is carried out, improvement in durability is aimed at or the method of making polyethylene and polypropylene contain an insecticide is taken as the treatment method for giving the durability of insect control nature When an effect is discovered by a medically important insect, flying vermin, unpleasant vermin, and clothing vermin etc. with durability, an effect is inadequate or it has the fault that the durability of an effect is short. Being attached furthermore to a cost overrun was also a problem.

[0004] Moreover, an organic phosphorus system insecticide has a problem in safety, and is regarded as questionable also to the termite.

[0005]

[Problem(s) to be Solved by the Invention] Then, as a result of inquiring in order to solve the short fault of the inadequate nature of the effect which the Prior art has, or durability, when a pyrethroid system insecticide is blended combining two or more sorts of olefin system polymers, it is, The durability of the insect control operation over a vermin could be controlled, and it found out that the durability of an insect control operation was moreover acquired over a long period of time.

[0006] That is, the purpose of this invention can control the durability of the insect control operation over a vermin, has the durability of an insect control operation over a long period of time, and is to offer the insect proof resin composition which was moreover excellent in weatherability, and its Plastic solid.

[0007]

[Means for Solving the Problem] according to this invention -- (A) -- relative -- the olefin system polymer 100 weight part of low translatability, and (B) -- relative -- the ethylene system polymer 10 or 400 weight parts and (C) pyrethroid system insecticide 0.3, or 15 weight parts of high translatability The Plastic solid which consists of the insect proof resin composition which has the durability of the insect control operation characterized by containing, and this resin composition thing is offered.

[0008]

[Function] this invention -- (A) -- relative -- the olefin system polymer 100 weight part of low translatability, and (B) -- it is the feature to have combined the ethylene system polymer 10 or 400 weight parts of high translatability relatively, and to have made this combination contain (C) pyrethroid system insecticide 0.3 or 15 weight parts.

[0009] By using the combination of the above-mentioned olefin system polymer, as compared with the case where independent [ of an olefin system polymer ] is used, the

durability of the insect control operation over a vermin can be controlled, an insect control operation can be made to be able to maintain over a long period of time, and, moreover, weatherability can be raised notably.

[0010] Please refer to Table 1 mentioned later. When a pyrethroid system insecticide is blended with an olefin system polymer independent, there are some which the thing of an insect control operation which is remarkably inferior also has, and show insect control operation (high knockdown rate) comparatively sufficient by short-time use, but it belongs to this latter. After \*\*\*\*\* (accelerated test for 60 degree-Cx six months), an insect control operation falls remarkably.

[0011] on the other hand, (A) -- relative -- the olefin system polymer of low translatability, and (B) -- while the constituent which used combination with the ethylene system polymer of high translatability relatively, and blended the pyrethroid system insecticide with this combination shows insect control operation comparatively sufficient natural by short-time use The insect control operation almost same also after a weathering test as the first stage is shown, and it is clear this constituent's to excel also in weatherability notably not to mention the durability of an insect control operation.

[0012] It is based on the phenomenon which the compounding agent blended with shift (migration), i.e., plasticization plastics, moves to the direction (surface) of low concentration from the high concentration side within a compound that an insect control operation is generally discovered by the insecticide blended into the resin Plastic solid. The grade which this shift phenomenon generates relates also to character, such as the compatibility of plastics and a compounding agent.

[0013] When a pyrethroid system insecticide is relatively blended with the olefin system polymer of low translatability, Since saying that an insect control operation is shown has very little shift of an insecticide, the outstanding insect control operation is shown in early stages of an insect control operation when a pyrethroid system insecticide is relatively blended with the ethylene system polymer of high translatability on the other hand, but shift of an insecticide is too early not much If a pyrethroid system insecticide is blended with the combination of both these resin in this invention to the durability of an insect control operation being missing the above -- the insect control operation after a weathering test improves by leaps and bounds, and it seems that this has given the insect control operation the decentralized structure of both resin controlled and excelled [ operation ] shift of a pyrethroid system insecticide in the optimal range, and its durability rather than predicted from which case.

[0014] Set to this invention. (A) if it is also important to use the ethylene system polymer of high translatability by the above-mentioned quantitative ratio at the olefin system polymer and (B) relative target of low translatability and (B) relative target has less content of the ethylene system polymer of high translatability relatively than the above-mentioned range The level of an insect control operation itself becomes low, and on the other hand, when more than the above-mentioned range, the trend for durability and weatherability to fall is to an insect control operation.

[0015] In this invention, a pyrethroid system insecticide is used as an insecticide, Although this thing is because it has excelling in the combination of the safety and the insect control operation to men and beasts, the kneading nature to an olefin system polymer, and moderate translatability, when blending by the above-mentioned quantitative ratio, the outstanding insect control operation and durability are acquired.

That is, when less than the above-mentioned range, there is a trend for an insect control operation and its durability to fall considerably as compared with this invention, an effect top does not have [ on the other hand, if more than the above-mentioned range, the physical properties of a resin composition thing will fall, or ] an exceptional advantage, either, and it is economically disadvantageous.

[0016]

[Best Mode of Carrying Out the Invention] In this invention, it is an olefin system polymer (A) of low translatability relatively, High density polyethylene (HDPE), medium density polyethylene (MDPE), or a polypropylene system polymer is used suitably, and here as a polypropylene system polymer Crystalline polypropylene system polymers, such as a homopolymer, random Como Pori Maher, and Brock Como Pori Maher, are used.

[0017] On the other hand, it is an ethylene system polymer of high translatability relatively, Low density polyethylene (LDPE), normal chain-like low density polyethylene (LLDPE), or an ethylene system copolymer is used suitably, and here as an ethylene system copolymer An ethylene-vinylacetate copolymer, an ethylene acrylic acid copolymer, an ionomer (ion bridge formation ethylene copolymer), an ethylene-propylene copolymer, an ethylene butene copolymer, etc. are used.

[0018] The combination of the resin which has moderate compatibility and takes decentralized structures, such as what is called a sea-island or stratified distribution, is . For example, the combination whose ethylene system polymer (B) of high translatability the olefin system polymer (A) of low translatability is high density polyethylene relatively, and is low density polyethylene relatively, The combination whose ethylene system polymer (B) of high translatability the olefin system polymer (A) of low translatability is a crystalline polypropylene system polymer relatively, and is low density polyethylene relatively is desirable.

[0019] As a pyrethroid system insecticide (C) \*\*, TERARE thorin, pyrethrin, allethrin, PURARE thorin, FURAME thorin, Resmethrin, PIRESUME thorin, FENO thorin, permethrin, bifenthrin, SHIFENO thorin, Shih Trun, Dell Tamet Lynn, TORAROME thorin, EMPEN thorin, lid RUSURIN, fenvalerate, SAIPAME thorin, It is used in that at least one sort of pyrethroid system compounds chosen from the group which consists of cyphenothrin, etofenprox, full FEMPU locks, full proxy Foeht, and silafluofen are independent, or two or more sorts of combination.

[0020] (A) Receive the olefin system polymer 100 weight part of low translatability relatively, (B) it is relatively good 10 or 400 weight parts, and to use the ethylene system polymer of high translatability in the quantity of 30 or 300 weight parts especially -- (B) - the durability of an insect control operation is controllable by changing the combination weight part of the ethylene system polymer of high translatability relatively. That is, what migration per unit time of a pyrethroid system insecticide is increased for (it lessens) is made by what the loadings of the (B) component are increased for (it lessens).

[0021] (C) The quantity of a pyrethroid system insecticide is good 0.3 or 15 weight parts especially 0.5, or to carry out 8 weight part combination to 100 weight parts of (A).

[0022] As long as a pyrethroid system insecticide exists in the method of combination of a pyrethroid system insecticide at the time of kneading of resin, there is no restriction, for example, it may blend with resin of both (A) and (B) simultaneously, or you may blend with one resin beforehand. Of course, the masterbatch which blended the pyrethroid

system insecticide by high concentration is prepared beforehand, and combination kneading can be carried out with the resin this masterbatch of whose is not blended.

[0023] In the resin composition thing of this invention, other additives, for example, inorganic fillers, a neutralizer, an antioxidant, an ultraviolet ray absorbent, an antistatic agent, a nucleus agent, a pigment, a dispersant, peroxide, etc. can be added if needed.

[0024] Moreover, shaping of extrusion, inflation SHON shaping, injection molding, blow molding, press forming, etc. is possible for the resin composition thing of this invention, and it is useful as the component parts, such as the box of a cookroom machine, a dresser with sink, the housing material of an electric device, a flooring material, a wall material, ceiling material, a storage case of clothing, and a wardrobe, or a member.

[0025] Although a work example explains this invention concretely below, this invention is not limited to these work examples.

[0026] It is a pyrethroid system insecticide (made by etofenprox Mitsui Toatsu Chemicals) 1 weight part to a work-example 1 high-density-polyethylene 30 weight part (product made from high ZEKKUSU 3300F Mitsui petrochemistry), and a low-density-polyethylene 70 weight part (product made from Myra Son 12 Mitsui petrochemistry). Inflation molding of the 0.13-mm-thick film was carried out for the included constituent.

[0027] It is a pyrethroid system insecticide (made by etofenprox Mitsui Toatsu Chemicals) 1 weight part to a work-example 2 high-density-polyethylene 50 weight part (product made from high ZEKKUSU 3300F Mitsui petrochemistry), and a low-density-polyethylene 50 weight part (product made from Myra Son 12 Mitsui petrochemistry). Inflation molding of the 0.13-mm-thick film was carried out for the included constituent.

[0028] It is a pyrethroid system insecticide (made by etofenprox Mitsui Toatsu Chemicals) 1 weight part to a work-example 3 high-density-polyethylene 70 weight part (product made from high ZEKKUSU 3300F Mitsui petrochemistry), and a low-density-polyethylene 30 weight part (product made from Myra Son 12 Mitsui petrochemistry). Inflation molding of the 0.13-mm-thick film was carried out for the included constituent.

[0029] It is a pyrethroid system insecticide (made by allethrin Sumitomo Chemical) 1 weight part to a work-example 4 high-density-polyethylene 50 weight part (product made from high ZEKKUSU 5000S Mitsui petrochemistry), and a low-density-polyethylene 50 weight part (product made from Myra Son 50 Mitsui petrochemistry). Extrusion of the included constituent was carried out to the 1.0-mm-thick sheet.

[0030] It is a pyrethroid system insecticide (made by allethrin Sumitomo Chemical) 1 weight part to the polypropylene 50 weight part (yes, product made from pole F301 Mitsui petrochemistry) of work-example 5 crystallinity, and a low-density-polyethylene 50 weight part (product made from Myra Son 50 Mitsui petrochemistry). Extrusion of the included constituent was carried out to the 1.0-mm-thick sheet.

[0031] Inflation molding of the 0.13-mm-thick film was carried out for the constituent containing the polypropylene 100 weight part (yes, product made from pole F301 Mitsui petrochemistry) of comparative example 1 crystallinity, and a pyrethroid system insecticide (made by etofenprox Mitsui Toatsu Chemicals) 1 weight part.

[0032] Inflation molding of the 0.13-mm-thick film was carried out for the constituent containing a comparative example 2 low-density-polyethylene 100 weight part (product made from Myra Son 50 Mitsui petrochemistry), and a pyrethroid system insecticide (made by etofenprox Mitsui Toatsu Chemicals) 1 weight part.

[0033] Extrusion of the constituent containing a comparative example 3 low-density-

polyethylene 100 weight part (product made from Myra Son 50 Mitsui petrochemistry) and a pyrethroid system insecticide (made by allethrin Sumitomo Chemical) 1 weight part was carried out to the 1.0-mm-thick sheet.

[0034] Inflation molding of the 0.13-mm-thick film was carried out for the constituent containing a comparative example 4 high-density-polyethylene 50 weight part (product made from high ZEKKUSU 3300F Mitsui petrochemistry), and a low-density-polyethylene 50 weight part (product made from Myra Son 12 Mitsui petrochemistry).

[0035] \* The insect control effect was evaluated about the sheet and film which were obtained by the effect nature work examples 1-5 and comparative examples 1-4 over a cockroach. The method investigated aging of the knockdown rate when putting in five *Blattella germanica* sexes each in the 9cm beaker in diameter, and contacting them on the above-mentioned sheet and a film directly. The examination followed the specimen for six months which carried out weathering treatment just behind manufacture and under 60 degrees C. The result is shown in Table 1.

[0036]

$$\text{ノックダウン率 (\%)} = \frac{\text{ノックダウン頭数}}{\text{全ゴキブリ頭数}}$$

[0037] Crystalline polypropylene having an initial effect lower than the result of a comparative example, and an effect seldom changing after weathering treatment, and not having a practical effect is found. Furthermore, in the case of low density polyethylene, although an initial effect is high, it is found that durability is short. On the other hand, in the work example, the initial effect has a practical effect after weathering treatment highly, and it became clear that durability was high. Furthermore, by changing the ratio of an olefin system polymer showed that durability was controllable according to a use.

[0038]

[Table 1]

## ノックダウン率

試験体	耐熱処理	ノックダウン率 (%)							
		2	5	12	24	48	72	96	(hr)
実施例	1	無	20	30	40	60	70	90	100 ←
		60℃×6ヶ月	10	30	30	50	70	70	90 100
	2	無	20	40	40	60	80	80	100 ←
		60℃×6ヶ月	20	40	40	60	70	80	70 90
	3	無	10	30	30	40	60	70	90 100
		60℃×6ヶ月	0	10	30	30	60	80	80 90
	4	無	0	10	20	40	40	60	80 80
		60℃×6ヶ月	0	0	20	30	30	50	60 60
	5	無	0	10	30	30	40	60	70
		60℃×6ヶ月	0	0	20	20	40	20	50 60
	1	無	0	0	10	10	10	20	20 30
		60℃×6ヶ月	0	0	10	20	30	30	40 40
比較例	2	無	20	30	50	70	80	100	← ←
		60℃×6ヶ月	0	0	0	10	10	30	30 30
	3	無	10	20	40	60	80	80	80 80
		60℃×6ヶ月	0	0	0	10	10	10	20 20
	4	無	0	0	0	0	0	0	0 10
		60℃×6ヶ月	0	0	0	0	0	0	0 0

[0039]

[Effect of the Invention] this invention -- (A) -- relative -- the olefin system polymer 100 weight part of low translatability, and (B) -- the ethylene system polymer 10 or 400 weight parts of high translatability were combined relatively, and this combination was made to contain (C) pyrethroid system insecticide 0.3 or 15 weight parts Therefore, as compared with the case where independent [ of an olefin system polymer ] is used, the durability of the insect control operation over a vermin can be controlled, an insect control operation can be made to be able to maintain over a long period of time, and, moreover, weatherability can be raised notably.

[Translation done.]

(use as many sheets as necessary)

Sheet	1	of	1
-------	---	----	---

Application Number	Unknown
Confirmation Number	Unknown
Filing Date	May 2, 2006
First Named Inventor	Hiroyuki MORI
Art Unit	Unknown
Examiner Name	Unknown
Attorney Docket Number	Q94456

[illegible][illegible][illegible]

**Examiner Signature**

**Date Considered**

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>2</sup> Applicant's unique classification designation number (optional). <sup>3</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or follow the hyperlink from the title of the document to the instant. <sup>4</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>5</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>6</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>7</sup> Applicant is to indicate here if English language Translation is attached.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/016779

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.<sup>7</sup> B29B9/12, C08L23/00, C08J3/12, D01F1/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.<sup>7</sup> B29B9/12, C08L23/00, C08J3/12, D01F1/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1926-1996 Toroku Jitsuyo Shinan Koho 1994-2005

Kokai Jitsuyo Shinan Koho 1971-2005 Jitsuyo Shinan Toroku Koho 1996-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 8-302080 A (Fukuvi Chemical Industry Co., Ltd.), 19 November, 1996 (19.11.96), Claims; Par. Nos. [0016] to [0023] (Family: none)	5, 6 1-4
Y	JP 8-81584 A (Mizusawa Industrial Chemicals, Ltd.), 26 March, 1996 (26.03.96), Claims; Par. Nos. [0083] to [0087] (Family: none)	5, 6
Y A	JP 8-113828 A (Nippon Ester Kabushiki Kaisha), 07 May, 1996 (07.05.96), Claims; Par. Nos. [0006]; examples (Family: none)	6 1-4

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

28 January, 2005 (28.01.05)

Date of mailing of the international search report

15 February, 2005 (15.02.05)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/016779

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The technical feature of the pellet of a two-layer structure for an insect control resin composition of claims 1-4 resides in that the pellet has a core-sheath structure to thereby prevent the insect control compound from bleeding to the pellet surface and retain satisfactory suitability for storage, etc. On the other hand, the insect control resin composition of claim 5 is merely a composition containing a specific proportion of a specific olefin resin composition and has no technical feature corresponding to the technical feature of claims 1-4. There is hence no technical relationship between the subject matter of claim 5 and the subject matter of claims 1-4 which involves (continued to extra sheet)

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/016779

Continuation of Box No.III of continuation of first sheet (2)

one or more identical or corresponding special technical features. The insect control fibers of claim 6 are ones formed by melt-spinning the resin composition of claim 5 and, like the subject matter of claim 5, have no technical feature corresponding to the technical feature of claims 1-4. There is hence no technical relationship between the subject matter of claim 6 and the subject matter of claims 1-4 which involves one or more identical or corresponding special technical features. Therefore, the subject matter of claims 1-4, that of claim 5, and that of claim 6 are not considered to be so linked as to form a single general inventive concept.